

REMARKS

Upon entry of this Amendment, claims 1-20 remain pending, with claims 1-14 under current examination, and claims 15-20 withdrawn from consideration as drawn to a nonelected invention. In the Office Action,¹ the Examiner took the following actions:

- (a) required a new title “that is clearly indicative of the invention to which the claims are directed” (Office Action, p. 2);
- (b) repeated the rejection of claims 1-4 and 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka (U.S. Patent No. 6,906,374) in view of Matsuoka et al. (U.S. Patent No. 6,809,364, hereinafter “Matsuoka”);
- (c) repeated the rejection of claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka in view of Matsuoka and further in view of Nguyen et al. (U.S. Publication No. 2004/0092095, hereinafter “Nguyen”);
- (d) objected to claims 5, 13, and 14 as being dependent upon a rejected base claim, but would allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims; and
- (e) responded to Applicant’s arguments in the Request for Reconsideration filed on December 22, 2005.

Applicant traverses the rejections and objection for the reasons that that follow.

Objection to the Title:

The Examiner objected to the title of the invention as not descriptive. In response, Applicant has amended the title and requests that the objection be withdrawn.

Rejection of Claims 1-4 and 10-12 under 35 U.S.C. § 103(a):

Applicant traverses the rejection of claims 1-4 and 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka in view of Matsuoka. Applicant respectfully disagrees with the

¹ The Office Action may contain statements characterizing the related art, case law, and claims. Regardless of whether any such statements are specifically identified herein, Applicant declines to automatically subscribe to any statements in the Office Action.

Examiner's arguments and conclusions. A *prima facie* case of obviousness has not been established.

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).” M.P.E.P. § 2142, 8th Ed., Rev. 4 (October 2005), p. 2100-134.

A *prima facie* case of obviousness has not been established because, among other things, neither Tanaka nor Matsuoka, nor their combination, teaches or suggests each and every element of Applicant's claims. Specifically, neither Tanaka nor Matsuoka, nor their combination, teaches or suggests at least Applicant's claimed “second insulating film *formed to cover an upper electrode of said MIM capacitor*,” as recited in independent claim 1 (emphasis added).

In the Office Action, the Examiner apparently took the position that Tanaka, col. 11, lines 35-38, defines the portion of metal film 54 at the boundary between the DRAM memory cell region and the DRAM peripheral circuit region as a “guard ring.” See Tanaka, Fig. 34. Fig. 34 apparently shows the rightmost lower electrode 54 being electrically insulated from the rest of the structures in Fig. 34, being surrounded on all sides by insulating films 56, 48, 46, and 42. The Examiner alleged that Tanaka teaches a “MIM capacitor having a lower metal electrode 54 or 11 (Fig. 1) (column 6, lines 15-16) and an upper metal electrode 58 (column 13, lines 47-50), and formed above the first insulating film 36/32; a second insulating film 48 formed to cover the MIM capacitor” (Office Action, p. 2).

However, an examination of Tanaka, particularly Fig. 34, reveals that second insulating film 48 does not cover the capacitor structure (lower electrode 54 / insulation film 56 / upper electrode 58). Specifically, the second insulating film 48 does not cover “an upper electrode of said MIM capacitor,” according to amended claim 1. Rather, the second insulating film 48 is formed adjacent to lower electrode 54 and underneath upper electrode 58. Thus, Tanaka does not teach or suggest Applicant’s claimed “second insulating film *formed to cover an upper electrode of said MIM capacitor*,” as recited in independent claim 1 (emphasis added).

The Examiner’s application of Matsuoka fails to cure the deficiencies of Tanaka just discussed. The Examiner apparently concedes that Matsuoka fails to teach or suggest the claimed “guard ring,” and relies on the Matsuoka only to teach a second wiring. *See* Office Action, p. 3. However, an examination of Matsuoka, particularly Fig. 22, reveals that memory capacitors 23 are not the same as the claimed “MIM capacitor” (claim 1). Further, Matsuoka’s Fig. 22 does not illustrate an upper electrode, so Matsuoka cannot teach Applicant’s claimed “second insulating film formed to cover an upper electrode of said MIM capacitor” (claim 1). Therefore, *prima facie* obviousness has not been established for at least the reason that Tanaka and Matsuoka do not teach or suggest each and every element of independent claim 1.

In addition, the Examiner has not established the requisite motivation necessary to combine Tanaka and Matsuoka. The Federal Circuit has noted that “virtually all [inventions] are combinations of old elements.” *See e.g., In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998) (internal citations omitted). The Federal Circuit has explained that an Examiner may find every element of a claimed invention in the prior art, but mere identification is not sufficient to negate patentability. *See Id.* The court explained that “the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with

no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.” Id.

Also, determinations of obviousness must be supported by evidence on the record. *See In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001), 59 USPQ2d 1693, 1696-98 (finding that the factual determinations central to the issue of patentability, including conclusions of obviousness by the Board, must be supported by “substantial evidence”). The desire to combine or modify references must be proved with “substantial evidence” that is a result of a “thorough and searching” factual inquiry. *See In re Lee*, 277 F.3d 1338, 1343-1344 (Fed. Cir. 2002), 61 USPQ2d 1430, 1433 (quoting *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52). Additionally, the Federal Circuit has clearly stated that the evidence of a motivation or suggestion to modify a reference must be “clear and particular.” *In re Dembicziak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

In this case, the Office Action does not show that a skilled artisan considering Tanaka and Matsuoka, and not having the benefit of Applicant’s disclosure, would have been motivated to combine the references in a manner resulting in Applicant’s claimed combination. Instead, the Examiner merely provided descriptions of how the references allegedly teach certain features without providing “clear and particular” reasons why a skilled artisan “would select the elements from the cited prior art references for combination in the manner claimed.” *See In re Dembicziak*, 175 F.3d at 999, 50 USPQ2d at 1617; *In re Rouffet*, 149 F.3d at 1357, 47 USPQ2d at 1457.

For example, the Examiner alleged “it would have been obvious to form a second wiring on the second insulating film of Tanaka because as taught by Matsuoka, such forming of the second wiring layer would provide an additional wiring layer desired for the semiconductor

device (column 8, lines 52-56)” (Office Action, p. 3). As discussed previously herein, Matsuoka’s capacitor 23 (Fig. 22) is not even a MIM capacitor, which would not lead one of ordinary skill in the art to consider Tanaka’s MIM capacitor in combination with Matsuoka’s capacitor 23, to supposedly produce the claimed invention. Therefore, the Examiner’s alleged advantage of providing a second wiring layer does not provide sufficient motivation to combine the two references.

Moreover, the fact that Matsuoka states that “naturally, additional wiring layers can be formed in the semiconductor storage device when necessary” (col. 8, lines 54-56) does not constitute a motivation for one of ordinary skill in the art to combine Tanaka and Matsuoka. The respective structures of Tanaka’s and Matsuoka’s devices do not lend themselves to combination, and if combined, do not produce the claimed invention. For example, Matsuoka’s wiring lines 26 are only connected to the *peripheral transistor* via layers 25, 21, and 19, and are not related to the *memory capacitors* 23 in any way. See Matsuoka’s Fig. 22. The apparent ability to form additional wiring layers “when necessary” (according to Matsuoka) is not determinative of whether one of ordinary skill in the art would have been motivated to combine the references. Moreover, any additional wiring lines in Tanaka, however, cannot be formed on the structure shown in Fig. 34 without interfering with the trench capacitor’s upper electrode 58. Thus, the Examiner has not shown that one of ordinary skill in the art would have been motivated to combine Tanaka and Matsuoka, viewing only teachings from within these references themselves, in a manner resulting in Applicant’s claimed invention.

Therefore, a *prima facie* case of obviousness has not been established, for at least the additional reason that the requisite motivation to modify Tanaka and Matsuoka, from within the references themselves, is lacking.

Independent claim 1 is therefore allowable, for the reasons argued above, and dependent claims 2-4 and 10-12 are also allowable at least by virtue of their respective dependence from allowable base claim 1. Therefore, Applicant requests that the improper 35 U.S.C. § 103(a) rejection be withdrawn.

Rejection of Claims 6-9 under 35 U.S.C. § 103(a):

Applicant traverses the rejection of claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka and Matsuoka in view of Nguyen. Applicant respectfully disagrees with the Examiner's arguments and conclusions. A *prima facie* case of obviousness has not been established.

Applicant has already demonstrated in the previous section that Tanaka and Matsuoka, taken alone or in combination, fail to teach or suggest all the elements of independent claim 1, from which claims 6-9 depend.

The Examiner's application of Nguyen, however, for its "forming of an insulating film 104 surrounding an interconnect and made of materials including fluorine containing silicon oxide (FSG), carbon containing silicon oxide (SiOC), or porous silicon oxide" (Office Action, p. 4), fails to cure the deficiencies of Tanaka and Matsuoka already discussed. Nguyen is drawn to a "pre-liner and liner," but also fails to teach the "guard ring," or "second insulating film formed to cover an upper electrode of said MIM capacitor," recited in claim 1 and required by dependent claims 6-9. See Nguyen, col. 2, par. [0002].

Thus, even if Nguyen were combined with Tanaka and Matsuoka, as the Examiner suggests, Nguyen does not cure their deficiencies and does not teach or suggest all elements recited in independent claim 1 and required by dependent claims 6-9. Therefore, the Examiner's

application of Nguyen as an additional reference does not establish *prima facie* obviousness of Applicant's dependent claims 6-9.

Because the cited references, taken alone or in combination, do not teach or suggest each and every element of independent claim 1, the Examiner's reliance on the cited references fails to establish *prima facie* obviousness of dependent claims 6-9. Dependent claims 6-9 are allowable at least by virtue of their respective dependence from allowable base claim 1. The improper 35 U.S.C. § 103(a) rejection should be withdrawn.

Objection to Claims 5, 13, and 14:

Since Applicant has demonstrated above that independent claim 1 is allowable, dependent claims 5, 13, and 14 are also allowable at least by virtue of their respective dependence from allowable base claim 1. Accordingly, Applicant requests withdrawal of the objection.

Conclusion:

In view of the foregoing, Applicant requests reconsideration of the application and withdrawal of the rejections and objection. Because Applicant's amendments and arguments have removed all of the pending rejections and objections, claims 1-14 are in condition for allowance, and Applicant requests a favorable action.

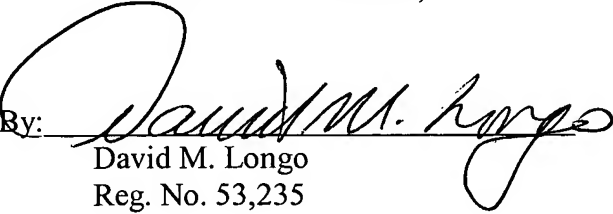
If there are any remaining issues or misunderstandings, Applicant requests the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: May 26, 2006

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